

sequence listing-21416.ST25  
SEQUENCE LISTING

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 Pro His Thr Val Ser Glu Ile Asp Phe Asp Ser Ser Arg Ala Glu Ser  
 405 410 415

gtc cag act cag agg aag cct agg ccc aag ggt cac gtc att gcc tgt 3349  
 Val Gln Thr Gln Arg Lys Pro Arg Pro Lys Gly His Val Ile Ala Cys  
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 535 540 545  
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 Ile Val Lys Ala His Val Ala Ser Glu Asn Cys Trp Ala Glu Tyr Arg  
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 Val Pro Ser Lys Asp  
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 625 630 635  
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aag atc atc cgg ttt ttg gtc gaa agc gga gat cac atc tcc tcc gga	4446
Lys Ile Ile Arg Phe Leu Val Glu Ser Gly Asp His Ile Ser Ser Gly 690 695 700	
gat atc tat gct gag gtt gag gtc atg aag atg atc ttg ccc ttg att	4494
Asp Ile Tyr Ala Glu Val Glu Val Met Lys Met Ile Leu Pro Leu Ile 705 710 715	
gcc cag gag tcc ggt cac gtt cag ttt gtc aag caa gcc ggt gtg acc	4542
Ala Gln Glu Ser Gly His Val Gln Phe Val Lys Gln Ala Gly Val Thr 720 725 730 735	
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Val Asp Pro Gly Ala 740 Ile Ile Gly Ile Leu 745 Ser Leu Asp Asp Pro Thr 750	
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Arg Val Lys Lys Ala Lys Pro Phe Glu Gly Leu Leu Pro Val Thr Gly 755 760 765	
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Leu Glu Ser Ile Tyr Ser Val Leu Asp Gly Tyr Glu Ser Asp Ser Thr 785 790 795	
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Ala Thr Ile Leu Arg Ser Phe Ser Glu Asn Leu Tyr Asp Pro Asp Leu 800 805 810 815	
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Pro Ala Asp Leu Glu Glu Ser Ile Arg Glu Val Ile Ser Glu Ala Gln 835 840 845	
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 Asp Pro Trp Ile Val Leu Ala Ser Leu Thr Val Tyr Val Leu Arg  
 1075 1080 1085

gc gtaagtgatc gttcttctcc tcttgcccaa acaatgactg acagttctat 5855  
 Ala

ctattccatc tgcag t tac cga gag tac agt att ctt gat atg caa cat 5904  
 Tyr Arg Glu Tyr Ser Ile Leu Asp Met Gln His  
 1090 1095

gag caa ggt cag gat ggc gct gct gga gtc atc act tgg cga ttc 5949  
 Glu Gln Gly Gln Asp Gly Ala Ala Gly Val Ile Thr Trp Arg Phe  
 1100 1105 1110

aag ctc aac cag ccc atc gct gag tct tct act ccc cga gtt gac 5994  
 12

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Lys	Leu	Asn	Gln	Pro	Ile	Ala	Glu	Ser	Ser	Thr	Pro	Arg	Val	Asp	
	1115					1120					1125				
tcg	aat	cga	gac	gtt	tac	cga	gtc	ggc	tcg	ctt	tct	gat	ttg	acc	6039
Ser	Asn	Arg	Asp	Val	Tyr	Arg	Val	Gly	Ser	Leu	Ser	Asp	Leu	Thr	
	1130					1135					1140				
tac	aag	atc	aag	cag	agt	cag	acc	gag	ccc	ctc	cga	gct	ggc	gtc	6084
Tyr	Lys	Ile	Lys	Gln	Ser	Gln	Thr	Glu	Pro	Leu	Arg	Ala	Gly	Val	
	1145					1150					1155				
atg	acg	agc	ttc	aac	aac	ttg	aag	gag	gtt	cag	gac	gga	ctc	ttg	6129
Met	Thr	Ser	Phe	Asn	Asn	Leu	Lys	Glu	Val	Gln	Asp	Gly	Leu	Leu	
	1160					1165					1170				
aat	gtt	ctg	tct	ttc	ttc	cct	gct	tac	cat	cat	caa	gat	ttc	act	6174
Asn	Val	Leu	Ser	Phe	Phe	Pro	Ala	Tyr	His	His	Gln	Asp	Phe	Thr	
	1175					1180					1185				
caa	cga	cat	ggc	cag	gac	agt	gcc	atg	ccc	aac	gtt	ctc	aac	att	6219
Gln	Arg	His	Gly	Gln	Asp	Ser	Ala	Met	Pro	Asn	Val	Leu	Asn	Ile	
	1190					1195					1200				
gct	atc	cgg	gct	ttc	gag	gag	aag	gac	gac	atg	tct	gat	ctt	gat	6264
Ala	Ile	Arg	Ala	Phe	Glu	Glu	Lys	Asp	Asp	Met	Ser	Asp	Leu	Asp	
	1205					1210					1215				
tgg	gcc	aag	agt	gtt	gag	tcg	ctg	gta	atg	cag	atg	tct	gcc	gag	6309
Trp	Ala	Lys	Ser	Val	Glu	Ser	Leu	Val	Met	Gln	Met	Ser	Ala	Glu	
	1220					1225					1230				
atc	cag	aag	aag	gga	att	cga	cga	gtt	acc	ttc	ttg	gtt	tgc	cga	6354
Ile	Gln	Lys	Lys	Gly	Ile	Arg	Arg	Val	Thr	Phe	Leu	Val	Cys	Arg	
	1235					1240					1245				
aag	ggc	gtt	tac	ccc	tcc	tac	ttc	acc	ttc	aga	caa	gag	ggc	gcc	6399
Lys	Gly	Val	Tyr	Pro	Ser	Tyr	Phe	Thr	Phe	Arg	Gln	Glu	Gly	Ala	
	1250					1255					1260				
cag	ggc	ccc	tgg	aga	gag	gag	gag	aag	att	cga	aac	atc	gag	cct	6444
Gln	Gly	Pro	Trp	Arg	Glu	Glu	Glu	Lys	Ile	Arg	Asn	Ile	Glu	Pro	
	1265					1270					1275				
gct	cta	gcc	agt	cag	ctt	gag	ctc	aac	cga	ctc	tcg	aat	ttc	aag	6489
Ala	Leu	Ala	Ser	Gln	Leu	Glu	Leu	Asn	Arg	Leu	Ser	Asn	Phe	Lys	
	1280					1285					1290				
gtc	acc	cct	atc	ttc	gta	gac	aac	aga	cag	atc	cac	atc	tac	aag	6534
Val	Thr	Pro	Ile	Phe	Val	Asp	Asn	Arg	Gln	Ile	His	Ile	Tyr	Lys	
	1295					1300					1305				
gga	gtg	ggc	aag	gag	aac	tct	tcc	gat	gtt	cga	ttc	ttt	atc	cgg	6579
Gly	Val	Gly	Lys	Glu	Asn	Ser	Ser	Asp	Val	Arg	Phe	Phe	Ile	Arg	
	1310					1315					1320				
gct	ttg	gtt	cga	cct	gga	cgg	gtc	cag	gga	tcg	atg	aag	gct	gcc	6624
Ala	Leu	Val	Arg	Pro	Gly	Arg	Val	Gln	Gly	Ser	Met	Lys	Ala	Ala	
	1325					1330					1335				
gag	tat	ctc	atc	tcc	gag	tgc	gat	cga	ctg	ctc	act	gat	atc	ctg	6669
Glu	Tyr	Leu	Ile	Ser	Glu	Cys	Asp	Arg	Leu	Leu	Thr	Asp	Ile	Leu	
	1340					1345					1350				
gac	gcc	ttg	gag	gtt	gtt	gga	gcc	gag	act	cga	aac	gcc	gat	tgc	6714
Asp	Ala	Leu	Glu	Val	Val	Gly	Ala	Glu	Thr	Arg	Asn	Ala	Asp	Cys	
	1355					1360					1365				
aac	cat	gtt	gga	att	aac	ttc	atc	tat	aac	gtt	ctt	gtc	gac	ttc	6759
										13					

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Asn	His	Val	Gly	Ile	Asn	Phe	Ile	Tyr	Asn	Val	Leu	Val	Asp	Phe		
1370						1375					1380					
gac	gac	gtc	cag	gag	gcc	ctt	gcc	ggg	ttc	att	gag	agg	cac	gga		6804
Asp	Asp	Val	Gln	Glu	Ala	Leu	Ala	Gly	Phe	Ile	Glu	Arg	His	Gly		
1385						1390					1395					
aag	agg	ctt	tgg	cga	ctt	cga	gtg	acc	g	gtaagtgttc	tctcggcatt					6852
Lys	Arg	Leu	Trp	Arg	Leu	Arg	Val	Thr								
1400						1405										
gaattcagca	atgagctgtg	actaacgggt	ttcttcggta	tattag	ct	tct	gaa									6906
					Ala	Ser	Glu								1410	
atc	cga	atg	gtt	ctt	gag	gac	gac	gag	ggg	aac	gtc	acc	ccc	atc		6951
Ile	Arg	Met	Val	Leu	Glu	Asp	Asp	Glu	Gly	Asn	Val	Thr	Pro	Ile		
				1415					1420					1425		
cga	tgc	tgc	att	gag	aac	gtt	tct	g	gtaagcagtc	caaaataact						6996
Arg	Cys	Cys	Ile	Glu	Asn	Val	Ser									
				1430												
gataatccta	ttcagctctag	acattgtaac	tgatgcattt	ctcgttctta	g	gt	ttc									7052
						Gly	Phe								1435	
gtc	gtg	aag	tac	cac	gcc	tac	cag	gag	gtt	gag	acc	gag	aag	ggg		7097
Val	Val	Lys	Tyr	His	Ala	Tyr	Gln	Glu	Val	Glu	Thr	Glu	Lys	Gly		
				1440					1445					1450		
act	acc	atc	ttg	aag	tca	atc	gga	gac	ctt	gga	cct	ctt	cac	ctt		7142
Thr	Thr	Ile	Leu	Lys	Ser	Ile	Gly	Asp	Leu	Gly	Pro	Leu	His	Leu		
				1455					1460					1465		
cag	cct	gtc	aac	cat	gct	tac	cag	acc	aag	aac	agt	ctt	cag	ccc		7187
Gln	Pro	Val	Asn	His	Ala	Tyr	Gln	Thr	Lys	Asn	Ser	Leu	Gln	Pro		
				1470					1475					1480		
cga	cga	tac	cag	gct	cac	ttg	gtt	gga	acg	act	tac	gtc	t			7227
Arg	Arg	Tyr	Gln	Ala	His	Leu	Val	Gly	Thr	Thr	Tyr	Val				
				1485					1490							
gttagtcaca	tttcatgctc	tggttttctg	accgtcactg	gttattgacg	ttctgtttgg											7287
cgtcacag	ac	gac	tac	ccc	gat	ctc	ttc	gtt	cag	agt	ttg	cgc	aag			7333
	Tyr	Asp	Tyr	Pro	Asp	Leu	Phe	Val	Gln	Ser	Leu	Arg	Lys			
		1495					1500					1505				
gtt	tgg	gct	gag	gct	gct	gct	aag	att	cct	cac	ctc	cgg	gtg	cct		7378
Val	Trp	Ala	Glu	Ala	Ala	Ala	Lys	Ile	Pro	His	Leu	Arg	Val	Pro		
			1510					1515					1520			
agc	gag	cct	ctt	acc	gct	acc	gag	ttg	gtt	ctc	gat	gag	aac	aac		7423
Ser	Glu	Pro	Leu	Thr	Ala	Thr	Glu	Leu	Val	Leu	Asp	Glu	Asn	Asn		
			1525					1530					1535			
gag	ctt	cag	gag	gtc	gag	cga	cct	ccg	ggg	tcc	aac	tgc	tgt	ggg		7468
Glu	Leu	Gln	Glu	Val	Glu	Arg	Pro	Pro	Gly	Ser	Asn	Ser	Cys	Gly		
			1540					1545					1550			
atg	gtc	gcc	tgg	atc	ttc	act	atg	ctc	act	ccc	gag	tat	ccc	aag		7513
Met	Val	Ala	Trp	Ile	Phe	Thr	Met	Leu	Thr	Pro	Glu	Tyr	Pro	Lys		
			1555					1560					1565			
ggg	cga	cga	gta	gtt	gcc	att	gcc	aac	gat	atc	acc	ttc	aag	att		7558
Gly	Arg	Arg	Val	Val	Ala	Ile	Ala	Asn	Asp	Ile	Thr	Phe	Lys	Ile		
			1570					1575					1580			

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gga tcc ttt ggt cct aag gaa gac gat tac ttc ttc aag gct act	7603
Gly Ser Phe Gly 1585 Pro Lys Glu Asp Asp 1590 Tyr Phe Phe Lys Ala 1595 Thr	
gaa att gcc aag aag ctg ggc ctt cct cga att tac ctc tct gcc	7648
Glu Ile Ala Lys 1600 Lys Leu Gly Leu Pro 1605 Arg Ile Tyr Leu Ser 1610 Ala	
aac agt gga gct aga ctc ggt atc gcg gag gag ctc ttg cac atc	7693
Asn Ser Gly Ala 1615 Arg Leu Gly Ile Ala 1620 Glu Glu Leu Leu His 1625 Ile	
ttc aag gcg gcc ttc gtt gac ccc gca aag cct tcc atg ggt att	7738
Phe Lys Ala Ala 1630 Phe Val Asp Pro Ala 1635 Lys Pro Ser Met Gly 1640 Ile	
aag tat cta tac ttg acc cct gaa act tta tcc act ctt gcc aag	7783
Lys Tyr Leu Tyr 1645 Leu Thr Pro Glu Thr 1650 Leu Ser Thr Leu Ala 1655 Lys	
aag gga tcc agc gtc acc act gag gag atc gag gat gac gcc gag	7828
Lys Gly Ser Ser 1660 Val Thr Thr Glu Glu 1665 Ile Glu Asp Asp Gly 1670 Glu	
cga cga cac aag atc acc gcc atc atc ggt ctt gca gag ggt ttg	7873
Arg Arg His Lys 1675 Ile Thr Ala Ile Ile 1680 Gly Leu Ala Glu Gly 1685 Leu	
gga gtt gag tct ctt cga gga tcc ggt ctt att gct gga gcc acc	7918
Gly Val Glu Ser 1690 Leu Arg Gly Ser Gly 1695 Leu Ile Ala Gly Ala 1700 Thr	
act cga gct tac gag gag gga atc ttc acc atc tct ctc gtt act	7963
Thr Arg Ala Tyr 1705 Glu Glu Gly Ile Phe 1710 Thr Ile Ser Leu Val 1715 Thr	
gcc cga tcg gtc ggt atc gga gct tac ttg gtt cga ttg ggt cag	8008
Ala Arg Ser Val 1720 Gly Ile Gly Ala Tyr 1725 Leu Val Arg Leu Gly 1730 Gln	
cga gct att cag gtt gaa ggc aac cct atg atc ctt act gga gct	8053
Arg Ala Ile Gln 1735 Val Glu Gly Asn Pro 1740 Met Ile Leu Thr Gly 1745 Ala	
cag tct ctc aac aag gtg ctt gga cga gag gtt tac act tcc aac	8098
Gln Ser Leu Asn 1750 Lys Val Leu Gly Arg 1755 Glu Val Tyr Thr Ser 1760 Asn	
ctt cag ctt gga gga acc cag att atg gcc cga aac ggt acc acg	8143
Leu Gln Leu Gly 1765 Gly Thr Gln Ile Met Ala Arg Asn Gly Thr 1775 Thr	
cat ctc gtc gct gaa tct gat ctc gat ggt gct ctc aag gtc atc	8188
His Leu Val Ala 1780 Glu Ser Asp Leu Asp 1785 Gly Ala Leu Lys Val 1790 Ile	
cag tgg ctc tcg tat gtg ccc gag cga aag ggc aag gcc att cct	8233
Gln Trp Leu Ser 1795 Tyr Val Pro Glu Arg 1800 Lys Gly Lys Ala Ile 1805 Pro	
atc tgg cct tcc gag gac cct tgg gac cga act gtg acc tac gag	8278
Ile Trp Pro Ser 1810 Glu Asp Pro Trp Asp 1815 Arg Thr Val Thr Tyr 1820 Glu	
cct ccc cga ggt cct tac gat cct cga tgg ttg ctt gaa gga aag	8323
Pro Pro Arg Gly 1825 Pro Tyr Asp Pro Arg 1830 Trp Leu Leu Glu Gly 1835 Lys	

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ccg	gat	gaa	ggc	ttg	act	ggt	ctt	ttc	gac	aag	gga	tct	ttc	atg	8368
Pro	Asp	Glu	Gly	Leu	Thr	Gly	Leu	Phe	Asp	Lys	Gly	Ser	Phe	Met	
			1840					1845					1850		
gag	acc	ctt	gga	gat	tgg	gcc	aag	act	atc	gtc	acc	ggt	cga	gcc	8413
Glu	Thr	Leu	Gly	Asp	Trp	Ala	Lys	Thr	Ile	Val	Thr	Gly	Arg	Ala	
			1855					1860					1865		
cga	ctg	gga	ggc	att	cct	atg	ggt	gtt	att	gct	gtc	gaa	acc	agg	8458
Arg	Leu	Gly	Gly	Ile	Pro	Met	Gly	Val	Ile	Ala	Val	Glu	Thr	Arg	
			1870					1875					1880		
acg	acc	gag	aag	atc	atc	gct	gcc	gat	cct	gcc	aac	cct	gca	gct	8503
Thr	Thr	Glu	Lys	Ile	Ile	Ala	Ala	Asp	Pro	Ala	Asn	Pro	Ala	Ala	
			1885					1890					1895		
ttc	gag	caa	aag	att	atg	gag	gct	ggt	cag	gtt	tgg	aac	ccc	aac	8548
Phe	Glu	Gln	Lys	Ile	Met	Glu	Ala	Gly	Gln	Val	Trp	Asn	Pro	Asn	
			1900					1905					1910		
gct	gct	tac	aag	acc	gct	caa	tcc	atc	ttt	gat	atc	aac	aag	gag	8593
Ala	Ala	Tyr	Lys	Thr	Ala	Gln	Ser	Ile	Phe	Asp	Ile	Asn	Lys	Glu	
			1915					1920					1925		
ggt	ctt	cct	ttg	atg	atc	ctt	gcc	aac	atc	cga	ggt	ttc	tct	gga	8638
Gly	Leu	Pro	Leu	Met	Ile	Leu	Ala	Asn	Ile	Arg	Gly	Phe	Ser	Gly	
			1930					1935					1940		
gga	cag	ggt	gat	atg	ttt	gac	gct	atc	ctc	aag	cag	ggt	tct	aag	8683
Gly	Gln	Gly	Asp	Met	Phe	Asp	Ala	Ile	Leu	Lys	Gln	Gly	Ser	Lys	
			1945					1950					1955		
atc	gtt	gac	ggt	ctc	tcg	aac	ttc	aag	cag	cca	gtg	ttc	gtc	tat	8728
Ile	Val	Asp	Gly	Leu	Ser	Asn	Phe	Lys	Gln	Pro	Val	Phe	Val	Tyr	
			1960					1965					1970		
gtt	gtc	ccc	aac	gga	gag	ctt	cgt	gga	gga	gct	tgg	gtc	gtg	ttg	8773
Val	Val	Pro	Asn	Gly	Glu	Leu	Arg	Gly	Gly	Ala	Trp	Val	Val	Leu	
			1975					1980					1985		
gat	cct	act	atc	aac	ctt	gcc	aag	atg	gag	atg	tac	gct	gat	gaa	8818
Asp	Pro	Thr	Ile	Asn	Leu	Ala	Lys	Met	Glu	Met	Tyr	Ala	Asp	Glu	
			1990					1995					2000		
acc	gct	cga	gga	gga	att	ctc	gag	ccg	gaa	ggt	atc	gtt	gag	atc	8863
Thr	Ala	Arg	Gly	Gly	Ile	Leu	Glu	Pro	Glu	Gly	Ile	Val	Glu	Ile	
			2005					2010					2015		
aag	ttc	cga	cga	gac	aag	gtc	atc	gct	acc	atg	gag	cga	ttg	gac	8908
Lys	Phe	Arg	Arg	Asp	Lys	Val	Ile	Ala	Thr	Met	Glu	Arg	Leu	Asp	
			2020					2025					2030		
gag	acc	tat	gcc	tct	ctc	aaa	gct	gcc	tcg	aac	gac	tca	acc	aag	8953
Glu	Thr	Tyr	Ala	Ser	Leu	Lys	Ala	Ala	Ser	Asn	Asp	Ser	Thr	Lys	
			2035					2040					2045		
tct	gcg	gag	gag	cga	gct	aag	agt	gct	gag	cta	ctc	aag	gca	aga	8998
Ser	Ala	Glu	Glu	Arg	Ala	Lys	Ser	Ala	Glu	Leu	Leu	Lys	Ala	Arg	
			2050					2055					2060		
gag	act	cta	ctt	caa	ccg	acg	tac	ttg	cag	att	gca	cac	ctt	tac	9043
Glu	Thr	Leu	Leu	Gln	Pro	Thr	Tyr	Leu	Gln	Ile	Ala	His	Leu	Tyr	
			2065					2070					2075		
gct	gat	ctc	cat	gat	cgt	gtc	gga	cga	atg	gag	gcc	aag	ggt	tgc	9088
Ala	Asp	Leu	His	Asp	Arg	Val	Gly	Arg	Met	Glu	Ala	Lys	Gly	Cys	
			2080					2085					2090		



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gcg aag cga gct gtc tgg gct gag gct cga cga ttc ttc tac tgg 9133  
Ala Lys Arg Ala Val Trp Ala Glu Ala Arg Arg Phe Phe Tyr Trp  
2095 2100 2105

cga ctt cga cga cgt ctc aac gat gag gtgagccgtc ccattcactc 9180  
Arg Leu Arg Arg Arg Leu Asn Asp Glu  
2110 2115

tttcgttgca aggttcagta gtactaaccg cttcttttctt tatctatcag cac atc 9236  
His Ile

ctg tct aag ttc gct gct gcc aac ccg gat ctt act ctc gag gag 9281  
Leu Ser Lys Phe Ala Ala Ala Asn Pro Asp Leu Thr Leu Glu Glu  
2120 2125 2130

cga caa aac att ctc gac tct gtc gtc cag act gac ctc act gat 9326  
Arg Gln Asn Ile Leu Asp Ser Val Val Gln Thr Asp Leu Thr Asp  
2135 2140 2145

gac cga gcc acc gct gaa tgg att gag cag tct gca gaa gag att 9371  
Asp Arg Ala Thr Ala Glu Trp Ile Glu Gln Ser Ala Glu Glu Ile  
2150 2155 2160

gct gct gcc gtt gcc gaa gtc cga tcc acc tac gtg tcg aat aag 9416  
Ala Ala Ala Val Ala Glu Val Arg Ser Thr Tyr Val Ser Asn Lys  
2165 2170 2175

att atc agc ttc gcc gag acg gag cga gct gga gcg ttg cag ggc 9461  
Ile Ile Ser Phe Ala Glu Thr Glu Arg Ala Gly Ala Leu Gln Gly  
2180 2185 2190

ttg gtc gct gtc ttg agc act ttg aat gcg gaa gac aag aag gcc 9506  
Leu Val Ala Val Leu Ser Thr Leu Asn Ala Glu Asp Lys Lys Ala  
2195 2200 2205

ctt gtt tct agc ctt ggt ctc taa attttaattt tttttgtcga tgctattctt 9560  
Leu Val Ser Ser Leu Gly Leu  
2210

cctatcttta gtctttgatt aacttttgaa tatccttcat agatctttcc ttgcatacat 9620

tgatattatt tcctcaccg tttttatgta cttccatacg agtttccatt tttttctgct 9680

tttatatttc gactacacgt cgactgttca cctgcctctc ttttgttctt tctgttctgt 9740

tttcttctgt tctttcgcct cttgggattc tatattctcc ttcgcattta catatgctca 9800

tgtaaatgtc tgactcagag ttactagga tatgtcgtga gagcccgaaa caagttgcac 9860

aacatatatt gataatgac agaacactct aagaccaccc agtccatgat cagccgcac 9920

gccagtttcg atctcttctc cattctcatc aacctcaatc tcctcccga tcgtcctgcc 9980

cagcagactg ccgaataact cgtcgacctg ctctcctgc cacaagtctt ccgttcgctc 10040

aggaaccatg aagttcatga tcttttcttg gggggtatat cgaagcttg cacctttaga 10100

agctcgtgta tcgagggtgg gcttggtgctt tttgggtccg taattggaaa aggttgcttg 10160

gcctatttca aaataaacga aattgatgat tataccaccg cgtagaccgt ttctggtcag 10220

gattttgtgt tggacgatga tataccgac gatgtttgag cagacaagg agttaggaag 10280

agactactta ccactcatag cgccgactcc agcacctcca cctcttcgct cgatgacgtc 10340

tctgaccaag ctctggtaaa actctttgtc atcaccccaa acggcggcct cacattcagc 10400

## sequencelisting-21416.ST25

ctcatcctga gagacgagtc ccatgaaccg atctactttt ttcctaccct ctagaccctc 10460  
 aaggggaagct ccaatttgct cgacgactcc gatcttgacg gatttaaact tttcacctcg 10520  
 aagattctga aggccttgag cggtcataat cttggaagac c 10561

&lt;210&gt; 2

&lt;211&gt; 6645

&lt;212&gt; DNA

&lt;213&gt; Phaffia rhodozyma

&lt;220&gt;

&lt;221&gt; CDS

&lt;222&gt; (1)..(6645)

&lt;223&gt;

&lt;400&gt; 2

atg gtt gtc gat cac gag agc gta agg cat ttc atc ggt gga aac gca	48
Met Val Val Asp His Glu Ser Val Arg His Phe Ile Gly Gly Asn Ala	
1 5 10 15	
ctt gag aac gcc cct ccg tca agc gtc acc gat ttc gtt aga agt caa	96
Leu Glu Asn Ala Pro Pro Ser Ser Val Thr Asp Phe Val Arg Ser Gln	
20 25 30	
gat ggt cac acg gtc atc acc aaa gtc ctc att gcc aac aac gga atc	144
Asp Gly His Thr Val Ile Thr Lys Val Leu Ile Ala Asn Asn Gly Ile	
35 40 45	
gct gct gta aaa gag atc cga tca gtt cgt aaa tgg gct tac gag acg	192
Ala Ala Val Lys Glu Ile Arg Ser Val Arg Lys Trp Ala Tyr Glu Thr	
50 55 60	
ttt gga gat gag cga gcc atc gaa ttt acg gta atg gcc act cca gaa	240
Phe Gly Asp Glu Arg Ala Ile Glu Phe Thr Val Met Ala Thr Pro Glu	
65 70 75 80	
gat ttg aag gtg aac tgc gac tat att cga atg gct gat cga gtc gtc	288
Asp Leu Lys Val Asn Cys Asp Tyr Ile Arg Met Ala Asp Arg Val Val	
85 90 95	
gaa gtt cct gga gga act aac aac aac aat cac tct aac gtc gac ctc	336
Glu Val Pro Gly Gly Thr Asn Asn Asn Asn His Ser Asn Val Asp Leu	
100 105 110	
atc gtt gac att gcc gag cga ttc aat ata cat gct gtt tgg gct gga	384
Ile Val Asp Ile Ala Glu Arg Phe Asn Ile His Ala Val Trp Ala Gly	
115 120 125	
tgg ggt cac gct tcg gaa aac ccc aga ctt ccc gag tct ctc gcc gcc	432
Trp Gly His Ala Ser Glu Asn Pro Arg Leu Pro Gly Ser Leu Ala Ala	
130 135 140	
tca aag aac aag atc gtc ttc att ggt cct ccc gga tcc gct atg cga	480
Ser Lys Asn Lys Ile Val Phe Ile Gly Pro Pro Gly Ser Ala Met Arg	
145 150 155 160	

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tcc ctt gga gac aag att tct tcg acc atc gtt gcc cag tct gcc cag	528
Ser Leu Gly Asp Lys 165 Ile Ser Ser Thr Ile Val Ala Gln Ser Ala Gln 175	
gtg ccg tgt atg gcc tgg tct gga tca ggc atc act gat aca gag ctc	576
Val Pro Cys Met 180 Ala Trp Ser Gly Ser 185 Gly Ile Thr Asp Thr 190 Glu Leu	
agc cct cag ggc ttc gtg act gtg ccc gat ggg cca tat cag gct gct	624
Ser Pro Gln Gly Phe Val Thr Val 200 Pro Asp Gly Pro Tyr 205 Gln Ala Ala	
tgt gta aag acg gtg gag gat ggt ttg gtg cga gcc gag aag atc ggt	672
Cys Val Lys Thr Val Glu Asp 215 Gly Leu Val Arg Ala Glu Lys Ile Gly 220	
ttg cca gtt atg atc aag gcc tct gag gga gga gga gga aag ggt atc	720
Leu Pro Val Met Ile Lys 230 Ala Ser Glu Gly 235 Gly Gly Lys Gly Ile 240	
cga atg gtt cac agc atg gac aca ttc aag aac tcc tac aac tcc gtc	768
Arg Met Val His Ser 245 Met Asp Thr Phe Lys 250 Asn Ser Tyr Asn Ser Val 255	
gct tcc gag gtg cca gga tct ccg att ttc atc atg gcc ttg gct gga	816
Ala Ser Glu Val 260 Pro Gly Ser Pro Ile Phe Ile Met Ala Leu 270 Ala Gly	
tct gct cga cat ttg gag gtc cag ctc ctt gct gat cag tac gga aac	864
Ser Ala Arg 275 His Leu Glu Val Gln 280 Leu Leu Ala Asp Gln Tyr Gly Asn 285	
gct atc tct ttg ttc ggt cga gat tgc tct gtt cag cga cga cat cag	912
Ala Ile Ser Leu Phe Gly Arg 295 Asp Cys Ser Val Gln 300 Arg Arg His Gln 305	
aag atc att gag gag gct ccc gtc acg atc gct cgt cca gag aga ttc	960
Lys Ile Ile Glu Glu Ala 310 Pro Val Thr Ile Ala Arg Pro Glu Arg Phe 320	
gaa gag atg gag aag gct gct gtc agg ttg gcc aag tta gta gga tat	1008
Glu Glu Met Glu Lys 325 Ala Ala Val Arg Leu Ala Lys Leu Val Gly Tyr 335	
gtt agt gcc ggt acc gtc gaa tac ctc tac tct cac gcc gac gac tca	1056
Val Ser Ala Gly 340 Thr Val Glu Tyr Leu Tyr Ser His Ala Asp 350 Asp Ser 355	
ttc ttc ttc ctc gaa ctc aac cct cga ctt caa gtc gag cac cct act	1104
Phe Phe Phe Leu Glu Leu Asn Pro Arg Leu Gln Val Glu His Pro Thr 365	
acc gag atg gtc tcg ggt gtc aac ctt ccc gct gct cag ctt cag att	1152
Thr Glu Met Val Ser Gly Val Asn Leu Pro Ala Ala Gln Leu Gln Ile 375	
gct atg ggt atc cct ctt tct cga att cgg gat att cga gtc ctc tac	1200
Ala Met Gly Ile Pro Leu Ser Arg Ile Arg Asp Ile Arg Val Leu Tyr 385	
ggt ctc gat ccc cac act gtt tcc gag atc gac ttc gac agc agc aga	1248
Gly Leu Asp Pro His 405 Thr Val Ser Glu Ile 410 Asp Phe Asp Ser 415 Arg Arg	
gcg gag tct gtc cag act cag agg aag cct agg ccc aag ggt cac gtc	1296
Ala Glu Ser Val 420 Gln Thr Gln Arg Lys 425 Pro Arg Pro Lys Gly His Val 430	

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att gcc tgt cga atc acg agt gaa aac ccc gat gag ggg ttc aag ccg Ile Ala Cys Arg Ile Thr Ser Glu Asn Pro Asp Glu Gly Phe Lys Pro 435 440 445	1344
tct gcc gga gat atc caa gag ttg aac ttc aga agt aat act aac gtc Ser Ala Gly Asp Ile Gln Glu Leu Asn Phe Arg Ser Asn Thr Asn Val 450 455 460	1392
tgg gga tac ttc tct gtt gga gct act gga gga att cat agt ttc gcc Trp Gly Tyr Phe Ser Val Gly Ala Thr Gly Gly Ile His Ser Phe Ala 465 470 475 480	1440
gat tct caa ttc ggt cac gtg ttt gct tat ggc tcc gac cga acg act Asp Ser Gln Phe Gly His Val Phe Ala Tyr Gly Ser Asp Arg Thr Thr 485 490 495	1488
gcc aga aag aat atg gtt atc gcc ttg aaa gag ctt tcc att cga gga Ala Arg Lys Asn Met Val Ile Ala Leu Lys Glu Leu Ser Ile Arg Gly 500 505 510	1536
gac ttc cga acc act gtc gag tat ctt atc act ctt ctt gag acg agc Asp Phe Arg Thr Thr Val Glu Tyr Leu Ile Thr Leu Glu Thr Ser 515 520 525	1584
gat ttc gag cag aac gcc att acc acc gct tgg ttg gat ggg ttg atc Asp Phe Glu Gln Asn Ala Ile Thr Thr Ala Trp Leu Asp Gly Leu Ile 530 535 540	1632
act aac aag ctt aca tct gag agg cct gat cca tca ctg gcc gtt att Thr Asn Lys Leu Thr Ser Glu Arg Pro Asp Pro Ser Leu Ala Val Ile 545 550 555 560	1680
tgt ggt gca att gtg aaa gct cac gtg gct tct gag aac tgt tgg gcc Cys Gly Ala Ile Val Lys Ala His Val Ala Ser Glu Asn Cys Trp Ala 565 570 575	1728
gaa tac cga cga gta ttg gac aag gga cag gtt ccc tcc aag gac act Glu Tyr Arg Arg Val Leu Asp Lys Gly Gln Val Pro Ser Lys Asp Thr 580 585 590	1776
ctc aag aca gtg ttc act ctt gat ttc atc tat gag ggt gtt cgg tac Leu Lys Thr Val Phe Thr Leu Asp Phe Ile Tyr Glu Gly Val Arg Tyr 595 600 605	1824
aat ttc acc gct gct cga gcc tcc ctc aac act tac cga ttg tat cta Asn Phe Thr Ala Ala Arg Ala Ser Leu Asn Thr Tyr Arg Leu Tyr Leu 610 615 620	1872
aac gga gga aag acc gtg gtg tcc atc cga cct ttg gcc gat ggt gga Asn Gly Gly Lys Thr Val Val Ser Ile Arg Pro Leu Ala Asp Gly Gly 625 630 635 640	1920
atg ctc gtt ctt ctc gat ggc cga tcc cac act ctc tac tgg agg gag Met Leu Val Leu Leu Asp Gly Arg Ser His Thr Leu Tyr Trp Arg Glu 645 650 655	1968
gaa gtc ggt acc ctc cga att cag gta gac gca aag act tgc ctg att Glu Val Gly Thr Leu Arg Ile Gln Val Asp Ala Lys Thr Cys Leu Ile 660 665 670	2016
gag cag gag aac gac ccc act cag ctc cga tca ccc tcg cct gga aag Glu Gln Glu Asn Asp Pro Thr Gln Leu Arg Ser Pro Ser Pro Gly Lys 675 680 685	2064
atc atc cgg ttt ttg gtc gaa agc gga gat cac atc tcc tcc gga gat Ile Ile Arg Phe Leu Val Glu Ser Gly Asp His Ile Ser Ser Gly Asp 690 695 700	2112

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atc	tat	gct	gag	gtt	gag	gtc	atg	aag	atg	atc	ttg	ccc	ttg	att	gcc	2160
Ile	Tyr	Ala	Glu	Val	Glu	Val	Met	Lys	Met	Ile	Leu	Pro	Leu	Ile	Ala	
705					710					715					720	
cag	gag	tcc	ggt	cac	gtt	cag	ttt	gtc	aag	caa	gcc	ggt	gtg	acc	gtc	2208
Gln	Glu	Ser	Gly	His	Val	Gln	Phe	Val	Lys	Gln	Ala	Gly	Val	Thr	Val	
				725					730					735		
gat	cct	gga	gcg	att	att	ggg	atc	ttg	agt	ctt	gat	gac	cct	acg	cga	2256
Asp	Pro	Gly	Ala	Ile	Ile	Gly	Ile	Leu	Ser	Leu	Asp	Asp	Pro	Thr	Arg	
			740					745					750			
gtg	aag	aag	gcg	aag	ccc	ttc	gag	ggt	ctc	ctg	cct	gtg	act	ggt	ctc	2304
Val	Lys	Lys	Ala	Lys	Pro	Phe	Glu	Gly	Leu	Leu	Pro	Val	Thr	Gly	Leu	
		755					760					765				
cct	aac	ctg	ccc	ggt	aac	aga	cct	cac	cag	cgg	cta	cag	ttc	cag	ctt	2352
Pro	Asn	Leu	Pro	Gly	Asn	Arg	Pro	His	Gln	Arg	Leu	Gln	Phe	Gln	Leu	
	770					775					780					
gag	tcg	ata	tac	tcg	gtc	ttg	gat	gga	tac	gag	agt	gac	tcc	act	gca	2400
Glu	Ser	Ile	Tyr	Ser	Val	Leu	Asp	Gly	Tyr	Glu	Ser	Asp	Ser	Thr	Ala	
785					790					795					800	
aca	atc	ctc	cga	tca	ttc	tct	gaa	aac	ctt	tat	gat	cct	gat	ctt	gct	2448
Thr	Ile	Leu	Arg	Ser	Phe	Ser	Glu	Asn	Leu	Tyr	Asp	Pro	Asp	Leu	Ala	
				805					810					815		
ttc	gga	gag	gct	tta	tcc	atc	att	tcc	gtc	ctt	tct	ggg	aga	atg	cct	2496
Phe	Gly	Glu	Ala	Leu	Ser	Ile	Ile	Ser	Val	Leu	Ser	Gly	Arg	Met	Pro	
			820					825					830			
gcc	gat	ctt	gag	gag	agc	att	cga	gag	gtc	atc	agc	gaa	gct	cag	tcg	2544
Ala	Asp	Leu	Glu	Glu	Ser	Ile	Arg	Glu	Val	Ile	Ser	Glu	Ala	Gln	Ser	
		835					840					845				
aag	cct	cac	gcc	gag	ttc	cct	gga	tca	aag	atc	ctc	aaa	gtc	gtc	gag	2592
Lys	Pro	His	Ala	Glu	Phe	Pro	Gly	Ser	Lys	Ile	Leu	Lys	Val	Val	Glu	
	850					855					860					
cgg	tac	atc	gat	aat	ttg	cga	cct	cag	gag	agg	gct	atg	gtc	cga	act	2640
Arg	Tyr	Ile	Asp	Asn	Leu	Arg	Pro	Gln	Glu	Arg	Ala	Met	Val	Arg	Thr	
865					870					875					880	
cag	atc	gaa	ccc	atc	gtt	ggt	att	gct	gag	aag	aac	gtt	ggc	ggt	cct	2688
Gln	Ile	Glu	Pro	Ile	Val	Gly	Ile	Ala	Glu	Lys	Asn	Val	Gly	Gly	Pro	
				885					890					895		
aag	ggt	tac	gcc	tct	tac	gtc	tta	gct	acc	atc	ctt	caa	aag	ttc	ttg	2736
Lys	Gly	Tyr	Ala	Ser	Tyr	Val	Leu	Ala	Thr	Ile	Leu	Gln	Lys	Phe	Leu	
			900					905					910			
gcc	gtt	gag	gcc	gtt	ttt	gct	act	ggt	agt	gaa	gag	gcc	att	gtt	ctc	2784
Ala	Val	Glu	Ala	Val	Phe	Ala	Thr	Gly	Ser	Glu	Glu	Ala	Ile	Val	Leu	
		915					920					925				
caa	ctt	cga	gat	gaa	aac	cga	gaa	tct	ttg	aac	gac	gtc	ctt	ggt	ctc	2832
Gln	Leu	Arg	Asp	Glu	Asn	Arg	Glu	Ser	Leu	Asn	Asp	Val	Leu	Gly	Leu	
	930					935					940					
gtc	ctg	gct	cac	tcg	cgt	ctc	agc	gct	cga	tcc	aag	ctt	gtt	ctc	tcc	2880
Val	Leu	Ala	His	Ser	Arg	Leu	Ser	Ala	Arg	Ser	Lys	Leu	Val	Leu	Ser	
945					950					955					960	
gtc	ttt	gat	ctg	atc	aag	tct	atg	cag	ctc	ctc	aac	aac	act	gag	ggt	2928
Val	Phe	Asp	Leu	Ile	Lys	Ser	Met	Gln	Leu	Leu	Asn	Asn	Thr	Glu	Gly	
				965					970					975		

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tct ttc ctt cat aag act atg aaa gcg ctt gcc gac atg ccc acc aag Ser Phe Leu His Lys Thr Met Lys Ala Leu Ala Asp Met Pro Thr Lys 980 985 990	2976
gct cct ttg gcc agc aag gtg tct ttg aag gct cgg gaa att ctt atc Ala Pro Leu Ala Ser Lys Val Ser Leu Lys Ala Arg Glu Ile Leu Ile 995 1000 1005	3024
tct tgc tct ctt ccc tct tac gag gag agg ttg ttc cag atg gaa Ser Cys Ser Leu Pro Ser Tyr Glu Glu Arg Leu Phe Gln Met Glu 1010 1015 1020	3069
aag atc ctt aac tct tct gtc acc act tct tac tac gga gag act Lys Ile Leu Asn Ser Ser Val Thr Thr Ser Tyr Tyr Gly Glu Thr 1025 1030 1035	3114
gga ggt gga cac aga aac cct tcg gtt gat gtt ctg act gag atc Gly Gly Gly His Arg Asn Pro Ser Val Asp Val Leu Thr Glu Ile 1040 1045 1050	3159
tca aac tct cga ttc acc gtc tac gat gtc ctg tcc tcc ttc ttc Ser Asn Ser Arg Phe Thr Val Tyr Asp Val Leu Ser Ser Phe Phe 1055 1060 1065	3204
aag cac gat gat cct tgg att gtt ctt gct agt ttg acc gtc tac Lys His Asp Asp Pro Trp Ile Val Leu Ala Ser Leu Thr Val Tyr 1070 1075 1080	3249
gtt ctt cga gct tac cga gag tac agt att ctt gat atg caa cat Val Leu Arg Ala Tyr Arg Glu Tyr Ser Ile Leu Asp Met Gln His 1085 1090 1095	3294
gag caa ggt cag gat ggc gct gct gga gtc atc act tgg cga ttc Glu Gln Gly Gln Asp Gly Ala Ala Gly Val Ile Thr Trp Arg Phe 1100 1105 1110	3339
aag ctc aac cag ccc atc gct gag tct tct act ccc cga gtt gac Lys Leu Asn Gln Pro Ile Ala Glu Ser Ser Thr Pro Arg Val Asp 1115 1120 1125	3384
tcg aat cga gac gtt tac cga gtc ggt tcg ctt tct gat ttg acc Ser Asn Arg Asp Val Tyr Arg Val Gly Ser Leu Ser Asp Leu Thr 1130 1135 1140	3429
tac aag atc aag cag agt cag acc gag ccc ctc cga gct ggt gtc Tyr Lys Ile Lys Gln Ser Gln Thr Glu Pro Leu Arg Ala Gly Val 1145 1150 1155	3474
atg acg agc ttc aac aac ttg aag gag gtt cag gac gga ctc ttg Met Thr Ser Phe Asn Asn Leu Lys Glu Val Gln Asp Gly Leu Leu 1160 1165 1170	3519
aat gtt ctg tct ttc ttc cct gct tac cat cat caa gat ttc act Asn Val Leu Ser Phe Phe Pro Ala Tyr His His Gln Asp Phe Thr 1175 1180 1185	3564
caa cga cat ggt cag gac agt gcc atg ccc aac gtt ctc aac att Gln Arg His Gly Gln Asp Ser Ala Met Pro Asn Val Leu Asn Ile 1190 1195 1200	3609
gct atc cgg gct ttc gag gag aag gac gac atg tct gat ctt gat Ala Ile Arg Ala Phe Glu Glu Lys Asp Asp Met Ser Asp Leu Asp 1205 1210 1215	3654
tgg gcc aag agt gtt gag tcg ctg gta atg cag atg tct gcc gag Trp Ala Lys Ser Val Glu Ser Leu Val Met Gln Met Ser Ala Glu 1220 1225 1230	3699

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atc Ile	cag Gln 1235	aag Lys	aag Lys	gga Gly	att Ile	cga Arg 1240	cga Arg	ggt Val	acc Thr	ttc Phe	ttg Leu 1245	ggt Val	tgc Cys	cga Arg	3744
aag Lys	ggc Gly 1250	ggt Val	tac Tyr	ccc Pro	tcc Ser	tac Tyr 1255	ttc Phe	acc Thr	ttc Phe	aga Arg	caa Gln 1260	gag Glu	ggt Gly	gcc Ala	3789
cag Gln 1265	ggc Gly	ccc Pro	tgg Trp	aga Arg	gag Glu	gag Glu 1270	gag Glu	aag Lys	att Ile	cga Arg	aac Asn 1275	atc Ile	gag Glu	cct Pro	3834
gct Ala 1280	cta Leu	gcc Ala	agt Ser	cag Gln	ctt Leu	gag Glu 1285	ctc Leu	aac Asn	cga Arg	ctc Leu	tcg Ser 1290	aat Asn	ttc Phe	aag Lys	3879
gtc Val 1295	acc Thr	cct Pro	atc Ile	ttc Phe	gta Val	gac Asp 1300	aac Asn	aga Arg	cag Gln	atc Ile	cac His 1305	atc Ile	tac Tyr	aag Lys	3924
gga Gly 1310	gtg Val	ggt Gly	aag Lys	gag Glu	aac Asn	tct Ser 1315	tcc Ser	gat Asp	ggt Val	cga Arg	ttc Phe 1320	ttt Phe	atc Ile	cgg Arg	3969
gct Ala 1325	ttg Leu	ggt Val	cga Arg	cct Pro	gga Gly	cgg Arg 1330	gtc Val	cag Gln	gga Gly	tcg Ser	atg Met 1335	aag Lys	gct Ala	gcc Ala	4014
gag Glu 1340	tat Tyr	ctc Leu	atc Ile	tcc Ser	gag Glu	tgc Cys 1345	gat Asp	cga Arg	ctg Leu	ctc Leu	act Thr 1350	gat Asp	atc Ile	ctg Leu	4059
gac Asp 1355	gcc Ala	ttg Leu	gag Glu	ggt Val	ggt Val	gga Gly 1360	gcc Ala	gag Glu	act Thr	cga Arg	aac Asn 1365	gcc Ala	gat Asp	tgc Cys	4104
aac Asn 1370	cat His	ggt Val	gga Gly	att Ile	aac Asn	ttc Phe 1375	atc Ile	tat Tyr	aac Asn	ggt Val	ctt Leu 1380	gtc Val	gac Asp	ttc Phe	4149
gac Asp 1385	gac Asp	gtc Val	cag Gln	gag Glu	gcc Ala	ctt Leu 1390	gcc Ala	ggg Gly	ttc Phe	att Ile	gag Glu 1395	agg Arg	cac His	gga Gly	4194
aag Lys 1400	agg Arg	ctt Leu	tgg Trp	cga Arg	ctt Leu	cga Arg 1405	gtg Val	acc Thr	gct Ala	tct Ser	gaa Glu 1410	atc Ile	cga Arg	atg Met	4239
ggt Val 1415	ctt Leu	gag Glu	gac Asp	gac Asp	gag Glu	ggt Gly 1420	aac Asn	gtc Val	acc Thr	ccc Pro	atc Ile 1425	cga Arg	tgc Cys	tgc Cys	4284
att Ile 1430	gag Glu	aac Asn	ggt Val	tct Ser	ggt Gly	ttc Phe 1435	gtc Val	gtg Val	aag Lys	tac Tyr	cac His 1440	gcc Ala	tac Tyr	cag Gln	4329
gag Glu 1445	ggt Val	gag Glu	acc Thr	gag Glu	aag Lys	ggt Gly 1450	act Thr	acc Thr	atc Ile	ttg Leu	aag Lys 1455	tca Ser	atc Ile	gga Gly	4374
gac Asp 1460	ctt Leu	gga Gly	cct Pro	ctt Leu	cac His	ctt Leu 1465	cag Gln	cct Pro	gtc Val	aac Asn	cat His 1470	gct Ala	tac Tyr	cag Gln	4419
acc Thr 1475	aag Lys	aac Asn	agt Ser	ctt Leu	cag Gln	ccc Pro 1480	cga Arg	cga Arg	tac Tyr	cag Gln	gct Ala 1485	cac His	ttg Leu	ggt Val	4464

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gga Gly	acg Thr 1490	act Thr	tac Tyr	gtc Val	tac Tyr	gac Asp 1495	tac Tyr	ccc Pro	gat Asp	ctc Leu	ttc Phe 1500	ggt Val	cag Gln	agt Ser	4509
ttg Leu	cgc Arg 1505	aag Lys	gtt Val	tgg Trp	gct Ala	gag Glu 1510	gct Ala	gct Ala	gct Ala	aag Lys	att Ile 1515	cct Pro	cac His	ctc Leu	4554
cgg Arg	gtg Val 1520	cct Pro	agc Ser	gag Glu	cct Pro	ctt Leu 1525	acc Thr	gct Ala	acc Thr	gag Glu	ttg Leu 1530	ggt Val	ctc Leu	gat Asp	4599
gag Glu	aac Asn 1535	aac Asn	gag Glu	ctt Leu	cag Gln	gag Glu 1540	gtc Val	gag Glu	cga Arg	cct Pro	ccg Pro 1545	ggt Gly	tcc Ser	aac Asn	4644
tcg Ser	tgt Cys 1550	ggt Gly	atg Met	gtc Val	gcc Ala	tgg Trp 1555	atc Ile	ttc Phe	act Thr	atg Met	ctc Leu 1560	act Thr	ccc Pro	gag Glu	4689
tat Tyr	ccc Pro 1565	aag Lys	ggt Gly	cga Arg	cga Arg	gta Val 1570	gtt Val	gcc Ala	att Ile	gcc Ala	aac Asn 1575	gat Asp	atc Ile	acc Thr	4734
ttc Phe	aag Lys 1580	att Ile	gga Gly	tcc Ser	ttt Phe	ggt Gly 1585	cct Pro	aag Lys	gaa Glu	gac Asp	gat Asp 1590	tac Tyr	ttc Phe	ttc Phe	4779
aag Lys	gct Ala 1595	act Thr	gaa Glu	att Ile	gcc Ala	aag Lys 1600	aag Lys	ctg Leu	ggc Gly	ctt Leu	cct Pro 1605	cga Arg	att Ile	tac Tyr	4824
ctc Leu	tct Ser 1610	gcc Ala	aac Asn	agt Ser	gga Gly	gct Ala 1615	aga Arg	ctc Leu	ggt Gly	atc Ile	gcg Ala 1620	gag Glu	gag Glu	ctc Leu	4869
ttg Leu	cac His 1625	atc Ile	ttc Phe	aag Lys	gcg Ala	gcc Ala 1630	ttc Phe	gtt Val	gac Asp	ccc Pro	gca Ala 1635	aag Lys	cct Pro	tcc Ser	4914
atg Met	ggt Gly 1640	att Ile	aag Lys	tat Tyr	cta Leu	tac Tyr 1645	ttg Leu	acc Thr	cct Pro	gaa Glu	act Thr 1650	tta Leu	tcc Ser	act Thr	4959
ctt Leu	gcc Ala 1655	aag Lys	aag Lys	gga Gly	tcc Ser	agc Ser 1660	gtc Val	acc Thr	act Thr	gag Glu	gag Glu 1665	atc Ile	gag Glu	gat Asp	5004
gac Asp	ggc Gly 1670	gag Glu	cga Arg	cga Arg	cac His	aag Lys 1675	atc Ile	acc Thr	gcc Ala	atc Ile	atc Ile 1680	ggt Gly	ctt Leu	gca Ala	5049
gag Glu	ggt Gly 1685	ttg Leu	gga Gly	gtt Val	gag Glu	tct Ser 1690	ctt Leu	cga Arg	gga Gly	tcc Ser	ggt Gly 1695	ctt Leu	att Ile	gct Ala	5094
gga Gly	gcc Ala 1700	acc Thr	act Thr	cga Arg	gct Ala	tac Tyr 1705	gag Glu	gag Glu	gga Gly	atc Ile	ttc Phe 1710	acc Thr	atc Ile	tct Ser	5139
ctc Leu	gtt Val 1715	act Thr	gcc Ala	cga Arg	tcg Ser	gtc Val 1720	ggt Gly	atc Ile	gga Gly	gct Ala	tac Tyr 1725	ttg Leu	gtt Val	cga Arg	5184
ttg Leu	ggt Gly 1730	cag Gln	cga Arg	gct Ala	att Ile	cag Gln 1735	gtt Val	gaa Glu	ggc Gly	aac Asn	cct Pro 1740	atg Met	atc Ile	ctt Leu	5229



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act Thr	gga Gly 1745	gct Ala	cag Gln	tct Ser	ctc Leu	aac Asn 1750	aag Lys	gtg Val	ctt Leu	gga Gly	cga Arg 1755	gag Glu	gtt Val	tac Tyr	5274
act Thr	tcc Ser 1760	aac Asn	ctt Leu	cag Gln	ctt Leu	gga Gly 1765	gga Gly	acc Thr	cag Gln	att Ile	atg Met 1770	gcc Ala	cga Arg	aac Asn	5319
ggt Gly	acc Thr 1775	acg Thr	cat His	ctc Leu	gtc Val	gct Ala 1780	gaa Glu	tct Ser	gat Asp	ctc Leu	gat Asp 1785	ggt Gly	gct Ala	ctc Leu	5364
aag Lys	gtc Val 1790	atc Ile	cag Gln	tgg Trp	ctc Leu	tcg Ser 1795	tat Tyr	gtg Val	ccc Pro	gag Glu	cga Arg 1800	aag Lys	ggc Gly	aag Lys	5409
gcc Ala	att Ile 1805	cct Pro	atc Ile	tgg Trp	cct Pro	tcc Ser 1810	gag Glu	gac Asp	cct Pro	tgg Trp	gac Asp 1815	cga Arg	act Thr	gtg Val	5454
acc Thr	tac Tyr 1820	gag Glu	cct Pro	ccc Pro	cga Arg	ggt Gly 1825	cct Pro	tac Tyr	gat Asp	cct Pro	cga Arg 1830	tgg Trp	ttg Leu	ctt Leu	5499
gaa Glu	gga Gly 1835	aag Lys	ccg Pro	gat Asp	gaa Glu	ggc Gly 1840	ttg Leu	act Thr	ggt Gly	ctt Leu	ttc Phe 1845	gac Asp	aag Lys	gga Gly	5544
tct Ser	ttc Phe 1850	atg Met	gag Glu	acc Thr	ctt Leu	gga Gly 1855	gat Asp	tgg Trp	gcc Ala	aag Lys	act Thr 1860	atc Ile	gtc Val	acc Thr	5589
ggt Gly	cga Arg 1865	gcc Ala	cga Arg	ctg Leu	gga Gly	ggc Gly 1870	att Ile	cct Pro	atg Met	ggt Gly	gtt Val 1875	att Ile	gct Ala	gtc Val	5634
gaa Glu	acc Thr 1880	agg Arg	acg Thr	acc Thr	gag Glu	aag Lys 1885	atc Ile	atc Ile	gct Ala	gcc Ala	gat Asp 1890	cct Pro	gcc Ala	aac Asn	5679
cct Pro	gca Ala 1895	gct Ala	ttc Phe	gag Glu	caa Gln	aag Lys 1900	att Ile	atg Met	gag Glu	gct Ala	ggt Gly 1905	cag Gln	gtt Val	tgg Trp	5724
aac Asn	ccc Pro 1910	aac Asn	gct Ala	gct Ala	tac Tyr	aag Lys 1915	acc Thr	gct Ala	caa Gln	tcc Ser	atc Ile 1920	ttt Phe	gat Asp	atc Ile	5769
aac Asn	aag Lys 1925	gag Glu	ggt Gly	ctt Leu	cct Pro	ttg Leu 1930	atg Met	atc Ile	ctt Leu	gcc Ala	aac Asn 1935	atc Ile	cga Arg	ggt Gly	5814
ttc Phe	tct Ser 1940	gga Gly	gga Gly	cag Gln	ggt Gly	gat Asp 1945	atg Met	ttt Phe	gac Asp	gct Ala	atc Ile 1950	ctc Leu	aag Lys	cag Gln	5859
ggt Gly	tct Ser 1955	aag Lys	atc Ile	gtt Val	gac Asp	ggt Gly 1960	ctc Leu	tcg Ser	aac Asn	ttc Phe	aag Lys 1965	cag Gln	cca Pro	gtg Val	5904
ttc Phe	gtc Val 1970	tat Tyr	gtt Val	gtc Val	ccc Pro	aac Asn 1975	gga Gly	gag Glu	ctt Leu	cgt Arg	gga Gly 1980	gga Gly	gct Ala	tgg Trp	5949
gtc Val	gtg Val 1985	ttg Leu	gat Asp	cct Pro	act Thr	atc Ile 1990	aac Asn	ctt Leu	gcc Ala	aag Lys	atg Met 1995	gag Glu	atg Met	tac Tyr	5994

## sequencelisting-21416.ST25

gct gat gaa acc gct cga gga gga att ctc gag ccg gaa ggt atc Ala Asp Glu Thr Ala Arg Gly Gly Ile Leu Glu Pro Glu Gly Ile	6039
2000 2005 2010	
gtt gag atc aag ttc cga cga gac aag gtc atc gct acc atg gag Val Glu Ile Lys Phe Arg Arg Asp Lys Val Ile Ala Thr Met Glu	6084
2015 2020 2025	
cga ttg gac gag acc tat gcc tct ctc aaa gct gcc tcg aac gac Arg Leu Asp Glu Thr Tyr Ala Ser Leu Lys Ala Ala Ser Asn Asp	6129
2030 2035 2040	
tca acc aag tct gcg gag gag cga gct aag agt gct gag cta ctc Ser Thr Lys Ser Ala Glu Glu Arg Ala Lys Ser Ala Glu Leu Leu	6174
2045 2050 2055	
aag gca aga gag act cta ctt caa ccg acg tac ttg cag att gca Lys Ala Arg Glu Thr Leu Leu Gln Pro Thr Tyr Leu Gln Ile Ala	6219
2060 2065 2070	
cac ctt tac gct gat ctc cat gat cgt gtc gga cga atg gag gcc His Leu Tyr Ala Asp Leu His Asp Arg Val Gly Arg Met Glu Ala	6264
2075 2080 2085	
aag ggt tgc gcg aag cga gct gtc tgg gct gag gct cga cga ttc Lys Gly Cys Ala Lys Arg Ala Val Trp Ala Glu Ala Arg Arg Phe	6309
2090 2095 2100	
ttc tac tgg cga ctt cga cga cgt ctc aac gat gag cac atc ctg Phe Tyr Trp Arg Leu Arg Arg Arg Leu Asn Asp Glu His Ile Leu	6354
2105 2110 2115	
tct aag ttc gct gct gcc aac ccg gat ctt act ctc gag gag cga Ser Lys Phe Ala Ala Ala Asn Pro Asp Leu Thr Leu Glu Glu Arg	6399
2120 2125 2130	
caa aac att ctc gac tct gtc gtc cag act gac ctc act gat gac Gln Asn Ile Leu Asp Ser Val Val Gln Thr Asp Leu Thr Asp Asp	6444
2135 2140 2145	
cga gcc acc gct gaa tgg att gag cag tct gca gaa gag att gct Arg Ala Thr Ala Glu Trp Ile Glu Gln Ser Ala Glu Glu Ile Ala	6489
2150 2155 2160	
gct gcc gtt gcc gaa gtc cga tcc acc tac gtg tcg aat aag att Ala Ala Val Ala Glu Val Arg Ser Thr Tyr Val Ser Asn Lys Ile	6534
2165 2170 2175	
atc agc ttc gcc gag acg gag cga gct gga gcg ttg cag ggc ttg Ile Ser Phe Ala Glu Thr Glu Arg Ala Gly Ala Leu Gln Gly Leu	6579
2180 2185 2190	
gtc gct gtc ttg agc act ttg aat gcg gaa gac aag aag gcc ctt Val Ala Val Leu Ser Thr Leu Asn Ala Glu Asp Lys Lys Ala Leu	6624
2195 2200 2205	
gtt tct agc ctt ggt ctc taa Val Ser Ser Leu Gly Leu	6645
2210	

&lt;210&gt; 3

&lt;211&gt; 2214

&lt;212&gt; PRT

## sequencelisting-21416.ST25

&lt;213&gt; Phaffia rhodozyma

&lt;400&gt; 3

Met Val Val Asp His Glu Ser Val Arg His Phe Ile Gly Gly Asn Ala  
 1 5 10 15  
 Leu Glu Asn Ala Pro Pro Ser Ser Val Thr Asp Phe Val Arg Ser Gln  
 20 25 30  
 Asp Gly His Thr Val Ile Thr Lys Val Leu Ile Ala Asn Asn Gly Ile  
 35 40 45  
 Ala Ala Val Lys Glu Ile Arg Ser Val Arg Lys Trp Ala Tyr Glu Thr  
 50 55 60  
 Phe Gly Asp Glu Arg Ala Ile Glu Phe Thr Val Met Ala Thr Pro Glu  
 65 70 75 80  
 Asp Leu Lys Val Asn Cys Asp Tyr Ile Arg Met Ala Asp Arg Val Val  
 85 90 95  
 Glu Val Pro Gly Gly Thr Asn Asn Asn Asn His Ser Asn Val Asp Leu  
 100 105 110  
 Ile Val Asp Ile Ala Glu Arg Phe Asn Ile His Ala Val Trp Ala Gly  
 115 120 125  
 Trp Gly His Ala Ser Glu Asn Pro Arg Leu Pro Glu Ser Leu Ala Ala  
 130 135 140  
 Ser Lys Asn Lys Ile Val Phe Ile Gly Pro Pro Gly Ser Ala Met Arg  
 145 150 155 160  
 Ser Leu Gly Asp Lys Ile Ser Ser Thr Ile Val Ala Gln Ser Ala Gln  
 165 170 175  
 Val Pro Cys Met Ala Trp Ser Gly Ser Gly Ile Thr Asp Thr Glu Leu  
 180 185 190  
 Ser Pro Gln Gly Phe Val Thr Val Pro Asp Gly Pro Tyr Gln Ala Ala  
 195 200 205  
 Cys Val Lys Thr Val Glu Asp Gly Leu Val Arg Ala Glu Lys Ile Gly  
 210 215 220  
 Leu Pro Val Met Ile Lys Ala Ser Glu Gly Gly Gly Lys Gly Ile  
 225 230 235 240  
 Arg Met Val His Ser Met Asp Thr Phe Lys Asn Ser Tyr Asn Ser Val  
 245 250 255

## sequence listing-21416.ST25

Ala Ser Glu Val Pro Gly Ser Pro Ile Phe Ile Met Ala Leu Ala Gly  
260 265 270

Ser Ala Arg His Leu Glu Val Gln Leu Leu Ala Asp Gln Tyr Gly Asn  
275 280 285

Ala Ile Ser Leu Phe Gly Arg Asp Cys Ser Val Gln Arg Arg His Gln  
290 295 300

Lys Ile Ile Glu Glu Ala Pro Val Thr Ile Ala Arg Pro Glu Arg Phe  
305 310 315 320

Glu Glu Met Glu Lys Ala Ala Val Arg Leu Ala Lys Leu Val Gly Tyr  
325 330 335

Val Ser Ala Gly Thr Val Glu Tyr Leu Tyr Ser His Ala Asp Asp Ser  
340 345 350

Phe Phe Phe Leu Glu Leu Asn Pro Arg Leu Gln Val Glu His Pro Thr  
355 360 365

Thr Glu Met Val Ser Gly Val Asn Leu Pro Ala Ala Gln Leu Gln Ile  
370 375 380

Ala Met Gly Ile Pro Leu Ser Arg Ile Arg Asp Ile Arg Val Leu Tyr  
385 390 395 400

Gly Leu Asp Pro His Thr Val Ser Glu Ile Asp Phe Asp Ser Ser Arg  
405 410 415

Ala Glu Ser Val Gln Thr Gln Arg Lys Pro Arg Pro Lys Gly His Val  
420 425 430

Ile Ala Cys Arg Ile Thr Ser Glu Asn Pro Asp Glu Gly Phe Lys Pro  
435 440 445

Ser Ala Gly Asp Ile Gln Glu Leu Asn Phe Arg Ser Asn Thr Asn Val  
450 455 460

Trp Gly Tyr Phe Ser Val Gly Ala Thr Gly Gly Ile His Ser Phe Ala  
465 470 475 480

Asp Ser Gln Phe Gly His Val Phe Ala Tyr Gly Ser Asp Arg Thr Thr  
485 490 495

Ala Arg Lys Asn Met Val Ile Ala Leu Lys Glu Leu Ser Ile Arg Gly  
500 505 510

Asp Phe Arg Thr Thr Val Glu Tyr Leu Ile Thr Leu Leu Glu Thr Ser  
515 520 525

## sequencelisting-21416.ST25

Asp Phe Glu Gln Asn Ala Ile Thr Thr Ala Trp Leu Asp Gly Leu Ile  
 530 535 540  
 Thr Asn Lys Leu Thr Ser Glu Arg Pro Asp Pro Ser Leu Ala Val Ile  
 545 550 555 560  
 Cys Gly Ala Ile Val Lys Ala His Val Ala Ser Glu Asn Cys Trp Ala  
 565 570 575  
 Glu Tyr Arg Arg Val Leu Asp Lys Gly Gln Val Pro Ser Lys Asp Thr  
 580 585 590  
 Leu Lys Thr Val Phe Thr Leu Asp Phe Ile Tyr Glu Gly Val Arg Tyr  
 595 600 605  
 Asn Phe Thr Ala Ala Arg Ala Ser Leu Asn Thr Tyr Arg Leu Tyr Leu  
 610 615 620  
 Asn Gly Gly Lys Thr Val Val Ser Ile Arg Pro Leu Ala Asp Gly Gly  
 625 630 635 640  
 Met Leu Val Leu Leu Asp Gly Arg Ser His Thr Leu Tyr Trp Arg Glu  
 645 650 655  
 Glu Val Gly Thr Leu Arg Ile Gln Val Asp Ala Lys Thr Cys Leu Ile  
 660 665 670  
 Glu Gln Glu Asn Asp Pro Thr Gln Leu Arg Ser Pro Ser Pro Gly Lys  
 675 680 685  
 Ile Ile Arg Phe Leu Val Glu Ser Gly Asp His Ile Ser Ser Gly Asp  
 690 695 700  
 Ile Tyr Ala Glu Val Glu Val Met Lys Met Ile Leu Pro Leu Ile Ala  
 705 710 715 720  
 Gln Glu Ser Gly His Val Gln Phe Val Lys Gln Ala Gly Val Thr Val  
 725 730 735  
 Asp Pro Gly Ala Ile Ile Gly Ile Leu Ser Leu Asp Asp Pro Thr Arg  
 740 745 750  
 Val Lys Lys Ala Lys Pro Phe Glu Gly Leu Leu Pro Val Thr Gly Leu  
 755 760 765  
 Pro Asn Leu Pro Gly Asn Arg Pro His Gln Arg Leu Gln Phe Gln Leu  
 770 775 780  
 Glu Ser Ile Tyr Ser Val Leu Asp Gly Tyr Glu Ser Asp Ser Thr Ala  
 785 790 795 800

## sequencelisting-21416.ST25

Thr Ile Leu Arg Ser Phe Ser Glu Asn Leu Tyr Asp Pro Asp Leu Ala  
 805 810 815  
 Phe Gly Glu Ala Leu Ser Ile Ile Ser Val Leu Ser Gly Arg Met Pro  
 820 825 830  
 Ala Asp Leu Glu Glu Ser Ile Arg Glu Val Ile Ser Glu Ala Gln Ser  
 835 840 845  
 Lys Pro His Ala Glu Phe Pro Gly Ser Lys Ile Leu Lys Val Val Glu  
 850 855 860  
 Arg Tyr Ile Asp Asn Leu Arg Pro Gln Glu Arg Ala Met Val Arg Thr  
 865 870 875 880  
 Gln Ile Glu Pro Ile Val Gly Ile Ala Glu Lys Asn Val Gly Gly Pro  
 885 890 895  
 Lys Gly Tyr Ala Ser Tyr Val Leu Ala Thr Ile Leu Gln Lys Phe Leu  
 900 905 910  
 Ala Val Glu Ala Val Phe Ala Thr Gly Ser Glu Glu Ala Ile Val Leu  
 915 920 925  
 Gln Leu Arg Asp Glu Asn Arg Glu Ser Leu Asn Asp Val Leu Gly Leu  
 930 935 940  
 Val Leu Ala His Ser Arg Leu Ser Ala Arg Ser Lys Leu Val Leu Ser  
 945 950 955 960  
 Val Phe Asp Leu Ile Lys Ser Met Gln Leu Leu Asn Asn Thr Glu Gly  
 965 970 975  
 Ser Phe Leu His Lys Thr Met Lys Ala Leu Ala Asp Met Pro Thr Lys  
 980 985 990  
 Ala Pro Leu Ala Ser Lys Val Ser Leu Lys Ala Arg Glu Ile Leu Ile  
 995 1000 1005  
 Ser Cys Ser Leu Pro Ser Tyr Glu Glu Arg Leu Phe Gln Met Glu  
 1010 1015 1020  
 Lys Ile Leu Asn Ser Ser Val Thr Thr Ser Tyr Tyr Gly Glu Thr  
 1025 1030 1035  
 Gly Gly Gly His Arg Asn Pro Ser Val Asp Val Leu Thr Glu Ile  
 1040 1045 1050  
 Ser Asn Ser Arg Phe Thr Val Tyr Asp Val Leu Ser Ser Phe Phe  
 1055 1060 1065

## sequencelisting-21416.ST25

Lys His Asp Asp Pro Trp Ile Val Leu Ala Ser Leu Thr Val Tyr  
 1070 1075 1080  
 Val Leu Arg Ala Tyr Arg Glu Tyr Ser Ile Leu Asp Met Gln His  
 1085 1090 1095  
 Glu Gln Gly Gln Asp Gly Ala Ala Gly Val Ile Thr Trp Arg Phe  
 1100 1105 1110  
 Lys Leu Asn Gln Pro Ile Ala Glu Ser Ser Thr Pro Arg Val Asp  
 1115 1120 1125  
 Ser Asn Arg Asp Val Tyr Arg Val Gly Ser Leu Ser Asp Leu Thr  
 1130 1135 1140  
 Tyr Lys Ile Lys Gln Ser Gln Thr Glu Pro Leu Arg Ala Gly Val  
 1145 1150 1155  
 Met Thr Ser Phe Asn Asn Leu Lys Glu Val Gln Asp Gly Leu Leu  
 1160 1165 1170  
 Asn Val Leu Ser Phe Phe Pro Ala Tyr His His Gln Asp Phe Thr  
 1175 1180 1185  
 Gln Arg His Gly Gln Asp Ser Ala Met Pro Asn Val Leu Asn Ile  
 1190 1195 1200  
 Ala Ile Arg Ala Phe Glu Glu Lys Asp Asp Met Ser Asp Leu Asp  
 1205 1210 1215  
 Trp Ala Lys Ser Val Glu Ser Leu Val Met Gln Met Ser Ala Glu  
 1220 1225 1230  
 Ile Gln Lys Lys Gly Ile Arg Arg Val Thr Phe Leu Val Cys Arg  
 1235 1240 1245  
 Lys Gly Val Tyr Pro Ser Tyr Phe Thr Phe Arg Gln Glu Gly Ala  
 1250 1255 1260  
 Gln Gly Pro Trp Arg Glu Glu Glu Lys Ile Arg Asn Ile Glu Pro  
 1265 1270 1275  
 Ala Leu Ala Ser Gln Leu Glu Leu Asn Arg Leu Ser Asn Phe Lys  
 1280 1285 1290  
 Val Thr Pro Ile Phe Val Asp Asn Arg Gln Ile His Ile Tyr Lys  
 1295 1300 1305  
 Gly Val Gly Lys Glu Asn Ser Ser Asp Val Arg Phe Phe Ile Arg  
 1310 1315 1320

## sequencelisting-21416.ST25

Ala Leu Val Arg Pro Gly Arg Val Gln Gly Ser Met Lys Ala Ala  
 1325 1330 1335  
 Glu Tyr Leu Ile Ser Glu Cys Asp Arg Leu Leu Thr Asp Ile Leu  
 1340 1345 1350  
 Asp Ala Leu Glu Val Val Gly Ala Glu Thr Arg Asn Ala Asp Cys  
 1355 1360 1365  
 Asn His Val Gly Ile Asn Phe Ile Tyr Asn Val Leu Val Asp Phe  
 1370 1375 1380  
 Asp Asp Val Gln Glu Ala Leu Ala Gly Phe Ile Glu Arg His Gly  
 1385 1390 1395  
 Lys Arg Leu Trp Arg Leu Arg Val Thr Ala Ser Glu Ile Arg Met  
 1400 1405 1410  
 Val Leu Glu Asp Asp Glu Gly Asn Val Thr Pro Ile Arg Cys Cys  
 1415 1420 1425  
 Ile Glu Asn Val Ser Gly Phe Val Val Lys Tyr His Ala Tyr Gln  
 1430 1435 1440  
 Glu Val Glu Thr Glu Lys Gly Thr Thr Ile Leu Lys Ser Ile Gly  
 1445 1450 1455  
 Asp Leu Gly Pro Leu His Leu Gln Pro Val Asn His Ala Tyr Gln  
 1460 1465 1470  
 Thr Lys Asn Ser Leu Gln Pro Arg Arg Tyr Gln Ala His Leu Val  
 1475 1480 1485  
 Gly Thr Thr Tyr Val Tyr Asp Tyr Pro Asp Leu Phe Val Gln Ser  
 1490 1495 1500  
 Leu Arg Lys Val Trp Ala Glu Ala Ala Ala Lys Ile Pro His Leu  
 1505 1510 1515  
 Arg Val Pro Ser Glu Pro Leu Thr Ala Thr Glu Leu Val Leu Asp  
 1520 1525 1530  
 Glu Asn Asn Glu Leu Gln Glu Val Glu Arg Pro Pro Gly Ser Asn  
 1535 1540 1545  
 Ser Cys Gly Met Val Ala Trp Ile Phe Thr Met Leu Thr Pro Glu  
 1550 1555 1560  
 Tyr Pro Lys Gly Arg Arg Val Val Ala Ile Ala Asn Asp Ile Thr  
 1565 1570 1575



## sequencelisting-21416.ST25

Phe Lys Ile Gly Ser Phe Gly Pro Lys Glu Asp Asp Tyr Phe Phe  
 1580 1585 1590  
 Lys Ala Thr Glu Ile Ala Lys Lys Leu Gly Leu Pro Arg Ile Tyr  
 1595 1600 1605  
 Leu Ser Ala Asn Ser Gly Ala Arg Leu Gly Ile Ala Glu Glu Leu  
 1610 1615 1620  
 Leu His Ile Phe Lys Ala Ala Phe Val Asp Pro Ala Lys Pro Ser  
 1625 1630 1635  
 Met Gly Ile Lys Tyr Leu Tyr Leu Thr Pro Glu Thr Leu Ser Thr  
 1640 1645 1650  
 Leu Ala Lys Lys Gly Ser Ser Val Thr Thr Glu Glu Ile Glu Asp  
 1655 1660 1665  
 Asp Gly Glu Arg Arg His Lys Ile Thr Ala Ile Ile Gly Leu Ala  
 1670 1675 1680  
 Glu Gly Leu Gly Val Glu Ser Leu Arg Gly Ser Gly Leu Ile Ala  
 1685 1690 1695  
 Gly Ala Thr Thr Arg Ala Tyr Glu Glu Gly Ile Phe Thr Ile Ser  
 1700 1705 1710  
 Leu Val Thr Ala Arg Ser Val Gly Ile Gly Ala Tyr Leu Val Arg  
 1715 1720 1725  
 Leu Gly Gln Arg Ala Ile Gln Val Glu Gly Asn Pro Met Ile Leu  
 1730 1735 1740  
 Thr Gly Ala Gln Ser Leu Asn Lys Val Leu Gly Arg Glu Val Tyr  
 1745 1750 1755  
 Thr Ser Asn Leu Gln Leu Gly Gly Thr Gln Ile Met Ala Arg Asn  
 1760 1765 1770  
 Gly Thr Thr His Leu Val Ala Glu Ser Asp Leu Asp Gly Ala Leu  
 1775 1780 1785  
 Lys Val Ile Gln Trp Leu Ser Tyr Val Pro Glu Arg Lys Gly Lys  
 1790 1795 1800  
 Ala Ile Pro Ile Trp Pro Ser Glu Asp Pro Trp Asp Arg Thr Val  
 1805 1810 1815  
 Thr Tyr Glu Pro Pro Arg Gly Pro Tyr Asp Pro Arg Trp Leu Leu  
 1820 1825 1830

## sequencelisting-21416.ST25

Glu Gly Lys Pro Asp Glu Gly Leu Thr Gly Leu Phe Asp Lys Gly  
 1835 1840 1845  
 Ser Phe Met Glu Thr Leu Gly Asp Trp Ala Lys Thr Ile Val Thr  
 1850 1855 1860  
 Gly Arg Ala Arg Leu Gly Gly Ile Pro Met Gly Val Ile Ala Val  
 1865 1870 1875  
 Glu Thr Arg Thr Thr Glu Lys Ile Ile Ala Ala Asp Pro Ala Asn  
 1880 1885 1890  
 Pro Ala Ala Phe Glu Gln Lys Ile Met Glu Ala Gly Gln Val Trp  
 1895 1900 1905  
 Asn Pro Asn Ala Ala Tyr Lys Thr Ala Gln Ser Ile Phe Asp Ile  
 1910 1915 1920  
 Asn Lys Glu Gly Leu Pro Leu Met Ile Leu Ala Asn Ile Arg Gly  
 1925 1930 1935  
 Phe Ser Gly Gly Gln Gly Asp Met Phe Asp Ala Ile Leu Lys Gln  
 1940 1945 1950  
 Gly Ser Lys Ile Val Asp Gly Leu Ser Asn Phe Lys Gln Pro Val  
 1955 1960 1965  
 Phe Val Tyr Val Val Pro Asn Gly Glu Leu Arg Gly Gly Ala Trp  
 1970 1975 1980  
 Val Val Leu Asp Pro Thr Ile Asn Leu Ala Lys Met Glu Met Tyr  
 1985 1990 1995  
 Ala Asp Glu Thr Ala Arg Gly Gly Ile Leu Glu Pro Glu Gly Ile  
 2000 2005 2010  
 Val Glu Ile Lys Phe Arg Arg Asp Lys Val Ile Ala Thr Met Glu  
 2015 2020 2025  
 Arg Leu Asp Glu Thr Tyr Ala Ser Leu Lys Ala Ala Ser Asn Asp  
 2030 2035 2040  
 Ser Thr Lys Ser Ala Glu Glu Arg Ala Lys Ser Ala Glu Leu Leu  
 2045 2050 2055  
 Lys Ala Arg Glu Thr Leu Leu Gln Pro Thr Tyr Leu Gln Ile Ala  
 2060 2065 2070  
 His Leu Tyr Ala Asp Leu His Asp Arg Val Gly Arg Met Glu Ala  
 2075 2080 2085

## sequencelisting-21416.ST25

Lys Gly Cys Ala Lys Arg Ala Val Trp Ala Glu Ala Arg Arg Phe  
 2090 2095 2100  
 Phe Tyr Trp Arg Leu Arg Arg Arg Leu Asn Asp Glu His Ile Leu  
 2105 2110 2115  
 Ser Lys Phe Ala Ala Ala Asn Pro Asp Leu Thr Leu Glu Glu Arg  
 2120 2125 2130  
 Gln Asn Ile Leu Asp Ser Val Val Gln Thr Asp Leu Thr Asp Asp  
 2135 2140 2145  
 Arg Ala Thr Ala Glu Trp Ile Glu Gln Ser Ala Glu Glu Ile Ala  
 2150 2155 2160  
 Ala Ala Val Ala Glu Val Arg Ser Thr Tyr Val Ser Asn Lys Ile  
 2165 2170 2175  
 Ile Ser Phe Ala Glu Thr Glu Arg Ala Gly Ala Leu Gln Gly Leu  
 2180 2185 2190  
 Val Ala Val Leu Ser Thr Leu Asn Ala Glu Asp Lys Lys Ala Leu  
 2195 2200 2205  
 Val Ser Ser Leu Gly Leu  
 2210

&lt;210&gt; 4

&lt;211&gt; 26

&lt;212&gt; DNA

&lt;213&gt; Artificial

&lt;220&gt;

&lt;221&gt; misc\_feature

&lt;222&gt; (6)..(6)

&lt;223&gt; n is a, c, g or t

&lt;220&gt;

&lt;221&gt; misc\_feature

&lt;222&gt; (9)..(9)

&lt;223&gt; n is a, c, g or t

## sequencelisting-21416.ST25

&lt;220&gt;

&lt;221&gt; misc\_feature

&lt;222&gt; (15)..(15)

&lt;223&gt; n is a, c, g or t

&lt;220&gt;

&lt;221&gt; misc\_feature

&lt;222&gt; (18)..(18)

&lt;223&gt; n is a, c, g or t

&lt;220&gt;

&lt;221&gt; misc\_feature

&lt;222&gt; (21)..(21)

&lt;223&gt; n is a, c, g or t

&lt;220&gt;

&lt;221&gt; misc\_feature

&lt;222&gt; (24)..(24)

&lt;223&gt; n is a, c, g or t

&lt;400&gt; 4

athggngcnt ayytngynmg nytngg

26

&lt;210&gt; 5

&lt;211&gt; 25

&lt;212&gt; DNA

&lt;213&gt; Artificial

&lt;220&gt;

&lt;221&gt; misc\_feature

&lt;222&gt; (3)..(3)

&lt;223&gt; n is a, c, g or t

&lt;220&gt;

&lt;221&gt; misc\_feature

sequence listing-21416.ST25

&lt;222&gt; (6)..(6)

&lt;223&gt; n is a, c, g or t

&lt;220&gt;

&lt;221&gt; misc\_feature

&lt;222&gt; (12)..(12)

&lt;223&gt; n is a, c, g or t

&lt;220&gt;

&lt;221&gt; misc\_feature

&lt;222&gt; (15)..(15)

&lt;223&gt; n is a, c, g or t

&lt;220&gt;

&lt;221&gt; misc\_feature

&lt;222&gt; (18)..(18)

&lt;223&gt; n is a, c, g or t

&lt;220&gt;

&lt;221&gt; misc\_feature

&lt;222&gt; (21)..(21)

&lt;223&gt; n is a, c, g or t

&lt;220&gt;

&lt;221&gt; misc\_feature

&lt;222&gt; (24)..(24)

&lt;223&gt; n is a, c, g or t

&lt;400&gt; 5

acnacnacc angcncncc nckna

25

&lt;210&gt; 6

&lt;211&gt; 26

&lt;212&gt; DNA

&lt;213&gt; Artificial

## sequencelisting-21416.ST25

<400> 6  
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26

<210> 7

<211> 26

<212> DNA

<213> Artificial

<400> 7  
tggatcctac tatcaacctg ccaaga

26

<210> 8

<211> 26

<212> DNA

<213> Artificial

<400> 8  
gtgaacactg tcttgagagt gtcctt

26

<210> 9

<211> 20

<212> DNA

<213> Artificial

<400> 9  
ccgctgctca gcttcagatt

20

<210> 10

<211> 19

<212> DNA

<213> Artificial

<400> 10  
gattagatag ggatctagt

19